AMENDMENTS TO THE CLAIMS

1.   (currently amended) A method for determining ~~an effect of~~ whether a test agent has an effect on a population of insects comprising

providing a population of transgenic insects comprising a human neurodegenerative disease gene;

identifying a trait of a specimen in the population before the administration of a said test agent;

administering said test agent to said population;

creating a digital image showing a trait of specimens in the population; and

~~correlating the traits of specimens in the population after administration of said agent with the effect of the test agent(s) administered to the population~~

identifying a difference between said trait before administration of said test agent and after administration of said test agent, wherein a difference identifies said agent as having an effect on said population of insects.

2.   (currently amended) A method for determining whether ~~an effect of~~ a test agent has an effect on a population of insects comprising

providing a plurality of populations of transgenic insects comprising a human neurodegenerative disease gene;

identifying at least two traits of a specimen in each of said populations before the administration of a said test agent

administering at least one test agent to each of said populations;

creating a digital image showing said at least two traits of specimens in each population;

for each population, correlating the traits of specimens of the population with the effect of the test agent(s) administered to the population. identifying a difference between said at least two traits before administration of said test agent and after administration of said test agent, wherein a difference identifies said agent as having an effect on said population of insects

3.   (currently amended) The method of claim 1 further comprising the step of quantifying at least one trait of said population shown in said digital image.

4.   (currently amended) The method of claim 2 further comprising the step of quantifying at least two traits of each population shown in said digital image

5.   (original) The method of claim 1 or 2 wherein said trait is selected from the group consisting of total distance traveled over a defined period of time, distance traveled in X direction over a defined period of time; distance traveled in Y direction over a defined period of time; total distance moved per time unit; distance moved in X direction per time unit; distance moved in Y direction per time unit); the rate of change of velocity per time unit, turning, stumbling, spatial position, and path shape.

6.   (previously presented) The method of claim 3 or 4 wherein said step of quantifying comprises measuring data selected from the group consisting of X-pos, X-speed, speed, turning, stumbling, size, T-count, P-count, T-length, Cross150, Cross250, and F-count.

7.   (withdrawn) The method of claim 1 or 2 wherein said trait is selected from the group consisting of movement of one insect toward or away from another insect, occurrence of no relative spatial displacement of two insects, occurrence of two insects within a defined distance from each other, and occurrence of two insects more than a defined distance away from each other.

8.   (withdrawn) The method of claim 1 or 2, wherein said trait is a morphological trait.

9.   (currently amended) The method of claim 2, wherein each population of said plurality of populations is contacted, each with a different test agent; the method further comprising the steps of:

generating an agent phenoprofile for each population, said agent phenoprofile comprising a quantitative description of said trait exhibited by transgenic insects in each population; ~~and~~

comparing said agent phenoprofile to a reference phenoprofile defined by said at least one trait that is measured in a reference population of insects; and

ranking said test agents according to the similarity or difference of each agent phenoprofile with a said reference phenoprofile ~~defined by said at least one trait that is measured in a reference population of insects~~.

10.   (previously presented) The method of claim 2, wherein each population of said plurality of populations is contacted, each with a different test agent, the method further comprising the steps of:

determining an agent phenoprofile for each of said populations, wherein the agent phenoprofile comprises a quantitative description of one or more traits exhibited by insects in the population;

comparing the agent phenoprofile to a reference phenoprofile, wherein the reference phenoprofile comprises a quantitative description of said one or more traits exhibited by insects in a reference population; and

selecting an agent that results in said agent phenoprofile being more or less similar to said reference phenoprofile.

11.   (original) The method of claim 9 or 10 wherein said trait is selected from the group consisting of total distance traveled over a defined period of time, distance traveled in X direction over a defined period of time; distance traveled in Y direction over a defined period of time; total distance moved per time unit; distance moved in X

direction per time unit; distance moved in Y direction per time unit); the rate of change of velocity per time unit, turning, stumbling, spatial position, and path shape.

12.   (original) The method of claim 9 or 10 wherein said step of determining comprises measuring data selected from the group consisting of X-pos, X-speed, speed, turning, stumbling, size, T-count, P-count, T-length, Cross150, Cross250, and F-count.

13.   (withdrawn) The method of claim 9 or 10 wherein said trait is selected from the group consisting of movement of one insect toward or away from another insect, occurrence of no relative spatial displacement of two insects, occurrence of two insects within a defined distance from each other, and occurrence of two insects more than a defined distance away from each other.

14.   (withdrawn) The method of claim 9 or 10 wherein said trait is a morphological trait.

15.   (previously presented) The method of claim 1 further comprising the steps of:

determining an agent phenoprofile for said population, wherein the agent phenoprofile comprises a quantitative description of one or more traits exhibited by insects in said population;

comparing the agent phenoprofile to a reference phenoprofile, wherein the reference phenoprofile comprises a quantitative description of said one or more traits exhibited by insects in a reference population; and

selecting an agent that results in said agent phenoprofile being more or less similar to said reference phenoprofile.

16.   (original) The method of claim 15 wherein said trait is selected from the group consisting of total distance traveled over a defined period of time, distance traveled in X direction over a defined period of time; distance traveled in Y direction over a defined period of time; total distance moved per time unit; distance moved in X direction per

time unit; distance moved in Y direction per time unit); the rate of change of velocity per time unit, turning, stumbling, spatial position, and path shape.

17.   (original) The method of claim 15 wherein said step of determining comprises measuring data selected from the group consisting of X-pos, X-speed, speed, turning, stumbling, size, T-count, P-count, T-length, Cross150, Cross250, and F-count.

18.   (withdrawn) The method of claim 15 wherein said trait is selected from the group consisting of movement of one insect toward or away from another insect, occurrence of no relative spatial displacement of two insects, occurrence of two insects within a defined distance from each other, and occurrence of two insects more than a defined distance away from each other.

19.   (withdrawn) The method of claim 15, wherein said trait is a morphological trait.

20.   (withdrawn) A method for determining parameters useful for a phenoprint comprising:

measuring a plurality of traits in a first population of insects, said first population having a first phenoprofile;

measuring said traits in a second population of insects, said second population having a second phenoprofile;

comparing the traits of the first population and the second population; and

identifying one or more traits that are different in said first and second populations, said one or more different traits defining the phenoprint.

21.   (original) The method of claim 1 or 9, wherein said step of determining comprises determining more than one trait.

22.   (original) The method of claim 21, wherein said at least two traits define a phenoprint.

23.   (previously presented) The method of claim 1, wherein said population is a population of transgenic insects which develops a phenotype due to expression of said transgene, the method further comprising the steps of:

determining an agent phenoprofile for the population at a plurality of times during the life of the insect;

comparing the agent phenoprofile generated at each of the plurality of times to a reference phenoprofile generated at each of the plurality of times for a reference population, wherein the reference population consists of insects not contacted with said test agent; and

determining whether said test agent modifies, delays or prevents onset of a trait of said agent phenoprofile in said population contacted with a test agent compared to said reference population.

24.   (previously presented) The method of claim 15, wherein said population of insects has a phenotype with characteristics of a mammalian disease.

25.   (original) The method of claim 23 or 24 wherein said trait is selected from the group consisting of total distance traveled over a defined period of time, distance traveled in X direction over a defined period of time; distance traveled in Y direction over a defined period of time; total distance moved per time unit; distance moved in X direction per time unit; distance moved in Y direction per time unit); the rate of change of velocity per time unit, turning, stumbling, spatial position, and path shape.

26.   (original) The method of claim 23 or 24 wherein said step of determining comprises measuring data selected from the group consisting of X-pos, X-speed, speed, turning, stumbling, size, T-count, P-count, T-length, Cross150, Cross250, and F-count.

27.   (withdrawn) The method of claim 23 or 24 wherein said trait is selected from the group consisting of movement of one insect toward or away from another insect, occurrence of no relative spatial displacement of two insects, occurrence of two insects

within a defined distance from each other, and occurrence of two insects more than a defined distance away from each other.

28.   (withdrawn) The method of claim 23 or 24, wherein said trait is a morphological trait.

29.   (original) The method of claim 1, 2, 9, 10, 15, 23, or 24 wherein said insect is a fly.

30.   (original) The method of claim 29, wherein said fly is Drosophila.

31.   (cancelled)

32.   (previously presented) The method of claim 1 or 2, wherein said insect is transgenic for a gene encoding a polypeptide with an expanded polyglutamine tract as compared to the wild-type polypeptide.

33.   (original) The method of claim 32, wherein the expression of the transgene results neurodegeneration in said specimen.

34.   (original) The method of claim 1, 2, 9, 10, 15, or 24 wherein said insect comprises a genetic mutation resulting in a loss of function or a gain of function.

35.   (original) The method of claim 9, 10, 15, 23, or 24, wherein said insect is a transgenic fly, and said reference population is selected from the group consisting of (i) transgenic flies not contacted with a test agent; (ii) transgenic flies contacted with an agent with a known activity on said flies; (iii) nontransgenic flies with the genetic background of the transgenic flies; or (iv) transgenic flies not expressing a disease gene and not contacted with a test agent.

36.   (withdrawn) The method of claim 9, 10, 15, 23, or 24, wherein said reference population is selected from the group consisting of (i) flies comprising a genetic mutation not contacted with a test agent; (ii) flies comprising a genetic mutation contacted with an agent with a known activity on said flies; or (iii) flies without the genetic mutation.

37.   (currently amended) A method for determining an effect of a test agent on a
population of insects comprising

    providing a population of transgenic insects;

    administering at least one test agent to said population;

    creating a digital image showing two or more traits of specimens in the
population;

    generating an agent phenoprofile, and comparing said agent phenoprofile with a
reference phenoprofile to generate a phenoprint; and

    identifying a difference between said phenoprint and a reference phenoprint,
wherein a difference identifies said agent as having an effect on said population of
insects ~~correlating the phenoprint of specimens in the population after administration of
said agent with the effect of the test agent(s) administered to the population~~.